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TRANSLATION METHODS OF INSTRUMENTS TO SIGN LANGUAGE: AN EVIDENCE-BASED PROPOSAL

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ABSTRACT

Objective: to identify translation methods of health research instruments into sign language and propose an evidence-based model.

Method: integrative review developed in the PubMed, LILACS, CINAHL, *Science Direct* and *Web of Science*, based on the descriptors "*sign language*", "*translations*", "*cross-cultural comparison*" and "*methods*". Articles were selected that described the translation method of research instruments into sign language, published between January 2006 and December 2016 in Portuguese, Spanish and English.

Results: nine articles were identified that complied with the inclusion criteria, which were analyzed based on the categories: Individualized translation processes; Group translation; Translations with adjustments per monolingual and bilingual groups; and Mixed translations. All studies developed the translation, back translation and adjustment phases of their versions to the original instrument, culminating in recorded final versions, some of which were published as software.

Conclusion: there is no consensus on a methodological model for translation into sign language. Thus, a method is proposed that comprises the following phases: individualized translations elaborated by a heterogeneous bilingual group, synthesis of translations, back translation, analysis and adjustments by expert judges, pilot and final recorded version.

DESCRIPTORS: Sign language. Deafness. Translation. Methods. Surveys and questionnaires.

METODOLOGIAS DE TRADUÇÃO DE INSTRUMENTOS PARA A LÍNGUA DE SINAIS: UMA PROPOSTA BASEADA EM EVIDÊNCIAS

RESUMO

Objetivo: identificar metodologias de tradução de instrumentos de pesquisa em saúde para língua de sinais e propor um modelo baseado em evidência.

Método: revisão integrativa realizada nas bases de dados PubMed, LILACS, CINAHL, *Science Direct* e *Web of Science*, a partir dos descritores "*sign language*", "*translations*", "*cross-cultural comparison*" e "*methods*". Foram selecionados artigos que descreviam a metodologia de tradução de instrumentos de pesquisa para língua de sinais, publicados de janeiro de 2006 a dezembro de 2016, nos idiomas português, espanhol e inglês.

Resultados: foram identificados nove artigos que respondiam aos critérios de inclusão, sendo analisados a partir das categorias: Processos de traduções individualizadas; Tradução em grupo; Traduções com ajustes por grupo monolíngue e bilíngue; e Traduções mistas. Todos os estudos realizaram as etapas de tradução, retrotradução e ajustes de suas versões com o instrumento original, culminando em versões finais filmadas, sendo alguns disponibilizados em *softwares*.

Conclusão: não há consenso sobre um modelo metodológico adotado para tradução para língua de sinais. Propõe-se, assim, uma metodologia que contemple as seguintes etapas: traduções individualizadas e elaboradas por um grupo heterogêneo bilíngue, síntese das traduções, retrotradução, análise e ajustes por juízes especialistas, piloto e versão final filmada.

DESCRITORES: Linguagem de sinais. Surdez. Tradução. Métodos. Inquéritos e questionários.

METODOLOGÍAS DE TRADUCCIÓN DE INSTRUMENTOS PARA EL LENGUAJE DE SEÑALES: UNA PROPUESTA BASADA EN EVIDENCIAS

RESUMEN

Objetivo: identificar metodologías de traducción de instrumentos de investigación en salud para lengua de signos y proponer un modelo basado en evidencia.

Método: Revisión integrativa realizada en la PubMed, LILACS, CINAHL, *Science Direct e Web of Science*, a partir de los descriptores: sign language, translations, cross-cultural comparison y methods. En el presente trabajo se analizaron los resultados obtenidos en el análisis de los resultados obtenidos en el análisis de los resultados obtenidos. Se seleccionaron artículos que describían la metodología de traducción de instrumentos de investigación para lengua de signos, publicados de enero de 2006 a diciembre de 2016, en los idiomas portugués, español e inglés.

Resultados: se identificaron nueve artículos que respondían a los criterios de inclusión, siendo analizados a partir de las categorías: Procesos de traducciones individualizadas; Traducción en grupo; Traducciones con ajustes por grupo monolingüe y bilingüe; y Traducciones mixtas. Todos los estudios realizaron las etapas de traducción, retro-traducción y ajustes de sus versiones con el instrumento original, culminando en versiones finales filmadas, siendo algunos disponibles en *softwares*.

Conclusión: no hay consenso sobre un modelo metodológico adoptado para la traducción al lenguaje de signos. Se propone una metodología que contemple las siguientes etapas: traducciones individualizadas y elaboradas por un grupo heterogéneo bilingüe, síntesis de las traducciones, retro-traducción, análisis y ajustes por jueces especialistas, piloto y versión final filmada.

DESCRIPTORES: Lenguaje de signos. Sordera. Traducción. Métodos. Encuestas y cuestionarios.

INTRODUCTION

The accuracy of research results remains a major concern among researchers. Clinical practice increasingly searches the best evidence to support safe care, as well as the quality of life of populations at all levels of health care. Thus, methodological models should guide the collection of reliable research data that certainly contribute to the advancement of science.

According to the World Federation of the Deaf (WFD),[1] there are currently about 70 million deaf people in the world and more than 300 sign languages. The number of translated research instruments adapted and validated to the sign languages, on the other hand, expresses negligence when one perceives the low number of studies that seek to guarantee these processes. In a systematic review, aimed at surveying studies that translated and validated health research instruments for sign language, only 29 instruments were found, and only 12 reported validation in the years 2008 to 2013.[2]

There is a consensus on the need for translation and adaptation of existing instruments, as this would be a more viable alternative if compared to the complex processes of elaborating a new instrument.

The values reflected by an instrument and the meaning of its items may vary from one culture to another, so that the quality of translation and validation is essential to ensure more reliable results.[3] Ensuring that these instruments are subject to adequate translation processes and cross-cultural adaptation in the deaf population becomes difficult, as there is no gold standard in the sign language translation processes in the world.

This research is relevant when analyzing studies with the deaf population that mention translation methodologies of research instruments into sign language. The objective of this study was to identify methods for translating health research instruments into sign language and to propose an evidence-based translation model.

METHOD

In order to respond to the proposed objectives, we chose to carry out an integrative review of the literature. The integrative review is recognized as a research method used in evidence-based practice with the objective of synthesizing research results on a given topic, in a systematic and orderly manner,[4] following six steps: identification of the theme and selection of the hypothesis or question for integrative review; establishment of criteria for inclusion and exclusion of studies / sampling or search in the literature; definition of the information to be extracted from the selected studies / categorization of the studies; evaluation of studies included in the integrative review; interpretation of results; and presentation of knowledge review / synthesis.[4]

In this review, the guiding question was: what methodologies have been used for the translation of health research instruments into sign language?

The search was performed with controlled descriptors of the Medical Subject Headings (MESH) and Health Sciences Descriptors (DeCS), with the help of the Boolean operator AND, as well as their respective synonyms by means of the Boolean operator OR.

The descriptors were: "sign language"; "translations"; "cross-cultural comparison"; and "meth-

ods". Three important databases of health and two general knowledge bases/library were used: US National Library of Medicine, National Institutes of Health (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Latin American Literature and (LILACS), Web of Science and ScienceDirect. In the LILACS database, the descriptor "cross-cultural comparison" and its correspondent were not found, making it impossible to cross this term with the others. Therefore, in that base, only "sign language" AND "translations" and "sign language" AND "translations" AND "methods" crossings were performed.

In the bases that permitted a detailed search, such as PubMED and LILACS, the following combinations were used, respectively: #1 ("Sign Language" [Mesh] OR (Language, Sign) OR (Languages, Sign) OR (Sign Languages)); #2 ("Methods"[Mesh] OR (Method) OR (Study, Methodological) OR (Studies, Methodological) OR (Methodological Studies) OR (Methodological Study) OR (Procedures) OR (Procedure) OR ("Translations" [Mesh])); #1 MH: "*Linguagem de Sinais*" OR (*Lenguaje de Signos*) OR (Sign Language) OR MH:E02.831.200.609.668 OR MH:F01.145.209.530.702.668 OR MH:L01.143.649.526.668; #2 MH: "/*métodos*" OR (/methods) OR (/*métodos*) OR (/*metodologia*) OR (/*procedimentos*) OR (/*técnicas*) OR MH:E05.581 OR MH:SP4.051.572 OR MH: "translating" OR (*traducción*) OR (*tradução*) OR MH: L01.143.506.423.796. In the other bases, the combinations of the abovementioned MESH terms were used.

The survey was conducted on December 28, 2016 by two nurse reviewers, one of whom held and M.Sc. and the other a Ph.D., and by one occupational therapist holding an M.Sc. In the first selection process, the articles were screened without limiting the search period, resulting in 1,225 articles. Then, the articles were selected by the criterion of publication in the past ten years, resulting in 596 articles. At first, this criterion was not used so as not to limit the findings, which could be rare due to the theme. This item was later included in the inclusion and exclusion criteria of the research (Table 1).

Table 1 – Search strategy to survey primary studies in the integrative review based on data from the past 10 years. Uberaba, MG, Brazil, 2016

Search strategy						
	Databases					
Descriptors	**PubMED**	**LILACS**	**CINAHL**	**Web of Science**	**Science Direct**	**Total**
sign language AND translations	5	31	21	58	12	127
sign language AND cross-cultural comparison	7	---	0	1	0	8
sign language AND translations AND methods	4	12	3	8	434	461
sign language AND translations AND cross-cultural comparison AND methods	0	---	0	0	0	0
Total	16	43	24	67	446	596

Two expert reviewers in the area read the title and abstract of the eligible primary studies. The inclusion criteria for articles in the final analysis were: primary studies describing the translation methodology and transcultural adaptation of standardized research instruments into sign language, studies published from January 2006 to December 2016 and studies in Portuguese, Spanish and English. The exclusion criteria were: editorials, response letters, experience reports, review studies, narrative literature / traditional review and review methods, as well as studies that did not describe and did not mention the translation methods of the instrument used, or that were not performed with deaf people. Twenty articles were selected, and the search result after reading the titles and abstracts can be observed by the criteria described in figure 1.

The validated instrument chosen to extract data from the selected articles consisted of study identification; institution that hosted the study; type of scientific journal; methodological characteristics and evaluation of the methodological rigor of the study.[5-6] For data analysis, the selected items of the instrument mentioned were title; journal; authors; instrument; main results or orientations of the authors, also adding specific items of the research theme, such as translation protocol, country and sign language.

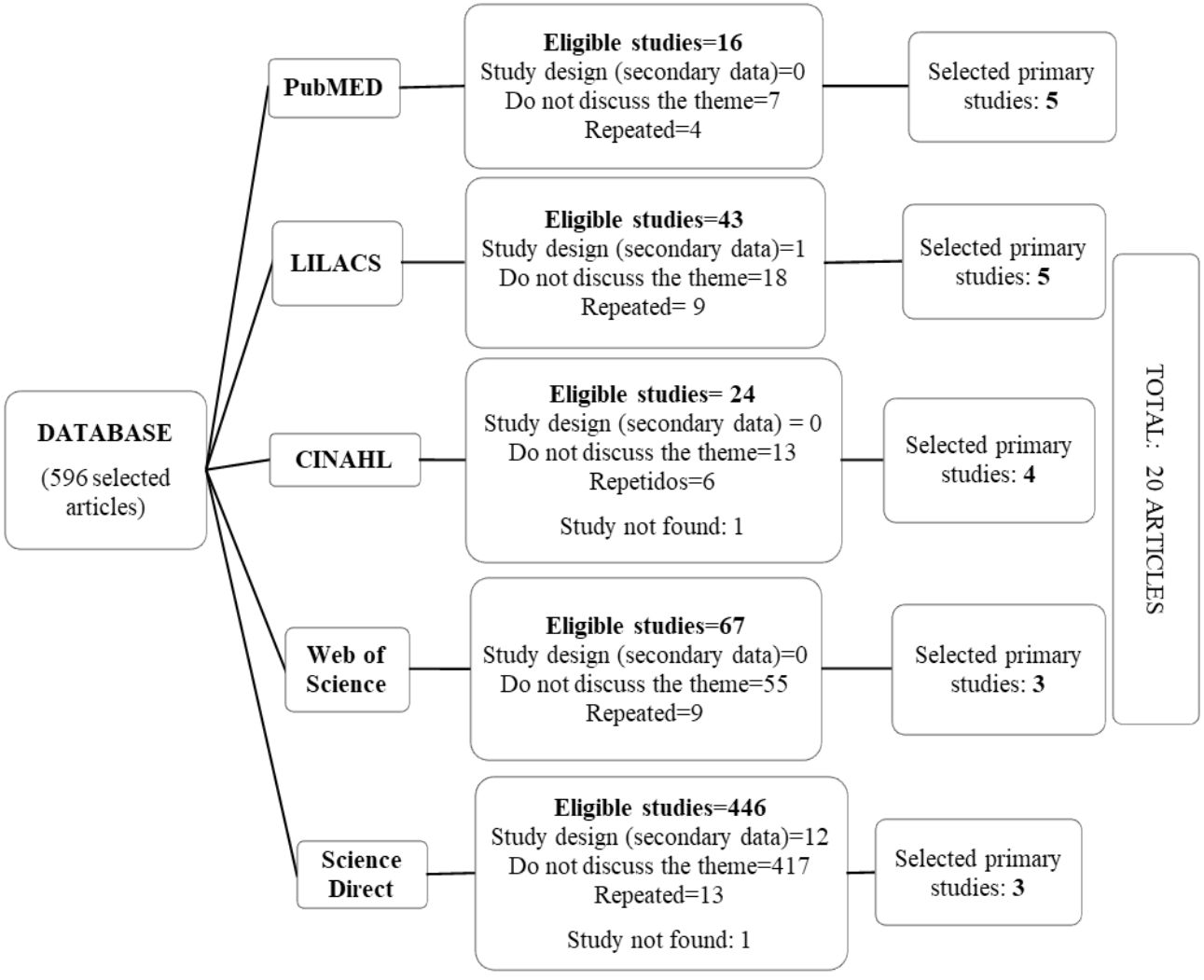

Figure 1 – Flowchart resulting from search for primary studies in the databases. Uberaba, MG, Brazil, 2016

RESULTS

Of the 20 articles selected for reading the full version, only nine met the criteria for inclusion. Eleven articles were excluded, as observed in figure 2.

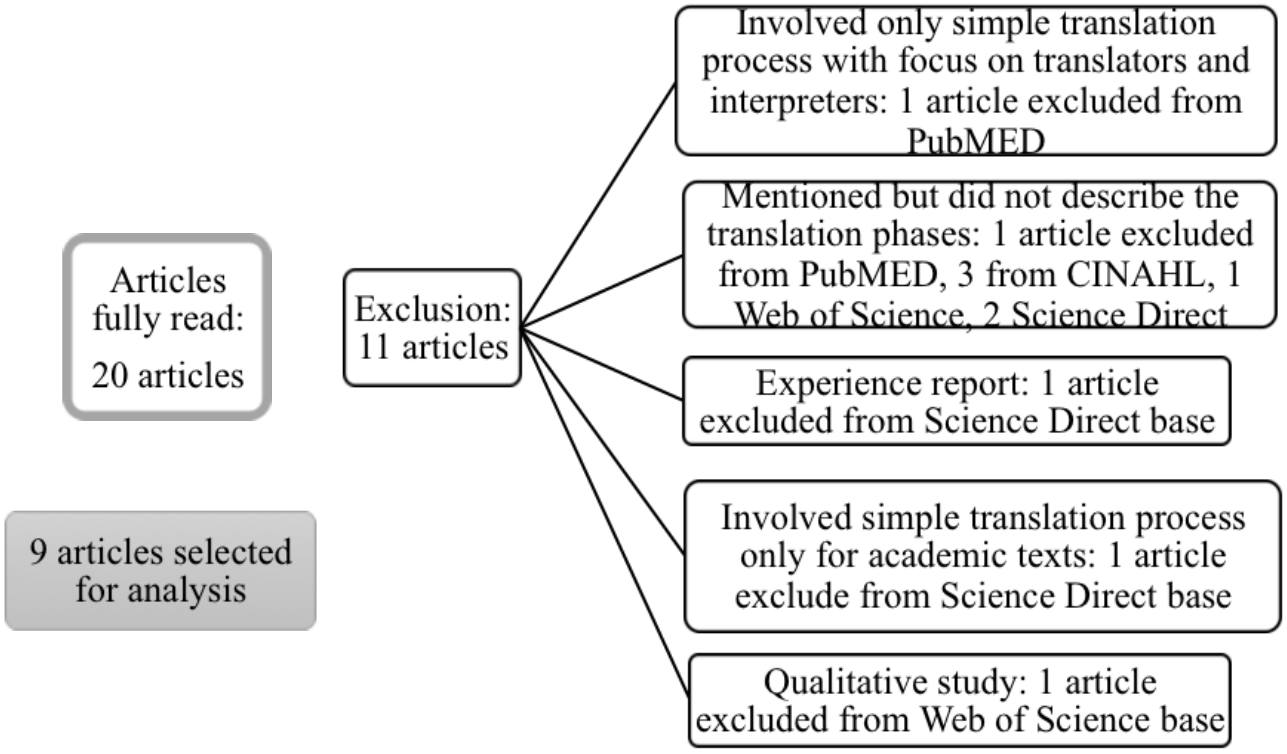

Figure 2 – Flowchart with articles excluded after reading of full version. Uberaba, MG, Brazil, 2016

Most of the instruments used were focused on mental health, covering aspects such as quality of life and self-esteem, and one scale was intended to measure intimacy between spouses. Only one instrument was aimed at the population of deaf adolescents; the others focused on the adult population. The sign languages mentioned were British (three articles), American (two articles), Spanish, Norwegian, Israeli and Brazilian (Table 2).

The instruments that went through the translation process and were validated with the deaf community presented reliable and valid psychometric coefficients for what they intended to measure. The authors of those instruments that have not been validated yet reinforced the importance of performing this procedure.

As for translation protocols, none of the articles followed a similar protocol, which ratifies that there was no standard, as described in the introduction of this article. Only two articles repeated a process as they related to the same research.

The translation and back-translation phases, and adjustments of their versions to the original instrument were executed and culminated in filmed final versions, some with versions made available in software.

Characteristics of articles found by category

The results pointed out a diversity of translation methodologies for research instruments into sign language. For the analysis, the data extracted from the articles were separated into four thematic categories on the translation process: individualized translation processes; group translation; translations with adjustments by monolingual and bilingual group; and mixed translations.

Table 2 – Description of data extracted from the articles analyzed. Uberaba, MG, Brazil, 2016

Category	Individualized translation processes	Individualized translation processes	Individualized translation processes	Individualized translation processes	Individualized translation processes	Group translation	Group translation	Translations with adjustments by monolingual and bilingual group	Mixed translations
Title	Validity and reliability of the Spanish sign language version of the KIDSCREEN-27 health -related quality of life questionnaire for use in deaf children and adolescents	The challenges of translating the clinical outcomes in routine evaluation -outcome measure (CORE--OM) into British sign language	The British sign language versions of the Patient Health Questionnaire, the Generalized Anxiety Disorder 7 - item Scale, and the Work and Social Adjustment Scale	The reliability of British sign language and English versions of the clinical outcomes in routine Evaluation - outcome measure with d/deaf populations in the UK: an initial study	Is it really clear? Adapting research tools for the needs of the deaf population	Translation of the multidimensional health locus of control scales for users of American sign language	Psychometric properties of a sign language version of the Mini International Neuropsychiatric Interview (MINI)	Instruments in Brazilian sign language for assessing the quality of life of the deaf population	Challenges in language, culture, and modality: translating English measures into American sign language
Journal	*Gaceta Sanitaria*	Journal of Deaf Studies and Deaf Education	Journal of Deaf Studies and Deaf Education	Health and Social Care in the Community	Journal of Social Work	Public Health Nursing	BMC Psychiatry	*Revista de Saúde Pública*	Nursing Research
Authors	Pardo-Guijarro et al.[7]	Rogers et al.[8]	Rogers et al.[9]	Rogers et al.[10]	Levinger e Ronem[11]	Samady et al.[12]	Øhre et al.[13]	Chaveiro et al.[14]	Jones et al.[15]
Instruments	KIDSCREEN-27	CORE-OM	PHQ, GAD-7 and WSAS	CORE-OM	Self-Esteem Scale, MIS, Intimacy Capability Questionnaire e DIDS	MHLC	MINI	WHOQOL-BREF and WHOQOL-Dis	SRAHP
Main results or guidelines by authors	Good confirmatory analysis and internal consistency, being reliable for use with the sample. Instrument validated for Spanish deaf adolescents only	The study recommends detailed phases for a successful translation process. Suggests submitting the instrument to a validation process	Good reliability and with positive correlation for anxiety items of CORE-OM and GAD-7. Instrument validated for the deaf population	Good reliability of instrument with validation for deaf population in sign language and British written language versions. Authors recommend the sign language version as reliable for the population	Three versions were elaborated for each instrument, being: original version, version with simplified writing and video version. For future research, the authors suggest the development of computer programs that offer different versions, but without involving interpreters	Translation by focus group with justifiable and appropriate protocol. Working with groups instead of isolated interpreters was suggested. Mentions that the next phase is the validation	Appropriate reliability and validity for diagnoses of mental illnesses in deaf people. Validated instrument for Norwegian deaf population	Need for adaptations in focus group method involving deaf people. Difficulties to graphically register the translation phases due to non-consolidated ortographic conventions in sign language and Portuguese idiomatic expressions. Does not mention validation	Acceptable internal consistency. Difficulty to recruit sample for test phase. The author suggests that the methods used are appropriate for studies involving similar populations

Category	Individualized translation processes	Individualized translation processes	Individualized translation processes	Individualized translation processes	Individualized translation processes	Group translation	Group translation	Translations with adjustments by monolingual and bilingual group	Mixed translations
Translation protocol	Two translations; two back translations; final assessment by a group of expert judges. Creation of a software to publish the translation	Individualized translation and back translation process involving bilingual deaf people, with discussion and adjustment by researchers and authors of the study and pilot test in online version	Individual translation process with five bilingual deaf people among interpreters, health professional and other professionals, synthesis phase of translations, back translation and production of final filmed version	Independent translation by five deaf people (deaf and professional interpreters), synthesis of translation versions, back translation by two separate people and independent from the study involving a test, with production of final version after adjustments	Individualized translation and back translation process with bilingual deaf and hearing people. The video version was analyzed individually and by four judges. During the collection, the respondents could request an interpreter for simultaneous translation	Translation and back translation process through focus group with bilingual deaf people and interpreters with high education levels	Translation and back translation process by groups of bilingual deaf and hearing people, with final filmed version after discussion and adjustments by research group	Translation based on 13 phases proposed by WHO for instrument validation. Processes of translation, back translation, focus groups, review by monolingual, bilingual group, recording and development of software in Brazilian sign language	Translation based on model adapted from Brislin elaborated for oral language, using derived etic paradigm. Mixing individualized translation process with group translations
Country and sign language	Spain, Spanish sign language	United Kingdom, British sign language	United Kingdom, British sign language	United Kingdom, British sign language	Israel, Israeli sign language	United States, American sign language	Norway, Norwegian sign language	Brazil, Brazilian sign language	United States, American sign language

CORE-OM: Clinical Outcomes in Routine Evaluation - Outcome Measure; PHQ: Patient Health Questionnaire; GAD-7: Generalized Anxiety Disorder 7-Item Scale; WSAS: The Work and Social Adjustment Scale; MIS: Multigenerational Interconnectedness Scale; DIDS: Deaf Identity Development Scale; MHLC: Multidimensional Health Locus of Control Scales; MINI: Mini International Neuropsychiatric Interview; WHOQOL-BREF: World Health Organization Quality of Life-Bref; WHOQOL-Dis: World Health Organization Quality of Life instrument for people with intellectual and physical disabilities; SRAHP: Self-Rated Abilities for Health Practices; WHO: World Health Organization.

Individualized translation processes

In their method, Pardo-Guijarro et al.[7] described the process of two translations and two back translations. Three bilingual deaf adults with high levels of reading skills performed the first translation. In addition, during this process, children were invited to translate each item into Spanish sign language alongside an interpreter, reaching a consensus. After analysis of the translations, the best version of each item culminated in the first recording of the translation. A bilingual deaf person and an interpreter, who had not participated in the translation process, carried out the first back translation. They independently translated each item from Spanish sign language into Spanish written language. The back translations were compared with the original Spanish version and, after discussing each item, adaptations were made to achieve the first adaptation. A second translation was performed to clarify ambiguous items, and the second back translation was developed with two additional translators. Finally, a group of deaf people and judges specialized in Spanish sign language analyzed and created the final version, which was made available in software.

In the study by Rogers et al.,[8] the first stage of translation was performed involving five bilingual deaf people from different professions, with individualized filming. In a second moment, the first author of the article and the creator of the original instrument reviewed the differences between the versions of the translations and produced a single

version in British sign language. Two independent deaf people in the study performed the back translation, while five British sign language users tested and scored divergent points in the sign language version. A group of five people also checked the back translation and compared it to the original, producing the final version, which was made available online after adjustments and pilot testing.

The article by Rogers et al.[9] portrays the translation based on the versions of five bilingual deaf persons, including interpreters, mental health professionals and other professionals. In Levinger and Ronen,[11] including the original author of the instrument, a revision and a summary of the translations were developed. Two individuals, not present in the translation process, back translated the instrument, while five sign-language users tested the version in British sign language (BSL). The feedback of everyone who participated in these processes culminated in the final version for the pilot test.

Rogers et al.[10] described the first stage as a translation, performed by five bilingual people with different professional backgrounds in British English and BSL. The translated versions were filmed individually. The second stage was marked by the revision of the translations by the first author of the research and by the original author of the instrument. In the third stage, a consensus version of the translations was produced. Two people without knowledge of the original instrument performed the fourth phase, which was the back translation. Concomitant to this process, five users of British sign language tested the sign-language version. The last stage involved the discussion and adjustment after testing and comparison with the original instrument, producing the final version for the pilot.

The participants in the study conducted by Levinger and Ronen[11] answered questionnaires by means of the original written version, simplified written version, or the video version using the Israeli sign language. The video version, elaborated for all the research instruments, was recorded by a specialized sign language translator and later, in an individualized process, back translated by four deaf judges, male and female, from hearing or deaf families and trained in Hebrew and in Israeli sign language. At the end of the analyses, the final video edition was prepared.

Group Translation

Samady et al.[12] used focus groups constituted by a convenience sample with bilingual members of the deaf community. The first translation involved three deaf people and two interpreters. The first back translation included two deaf and three interpreters. The deaf had at least a college degree and three held a post-graduation degree. Cultural equivalence was performed in the translation group. Members shared their translations and discussed each item. The final translation was filmed. The back translation group was invited to translate each item separately in order to share and check for consensus.

Øhre et al.[13] worked with bilingual groups, including listeners, deaf individuals and researchers. During the back translation, a new group was recruited, formed by members who had no contact with the original instrument. For comparison and analysis of translations, the group of researchers compared the version of the back translation with the original, culminating in the final filmed version.

Translations with adjustments by monolingual and bilingual group

The article by Chaveiro et al.[14] used the method recommended by WHO, adapted to the needs of a translation into sign language. Thirteen stages were carried out, namely: creation of the quality of life sign, development of the response scale of the instrument adapted to sign language, first translation by bilingual group, consensus version in the fourth stage; first back translation, production of the version in Brazilian sign language (LIBRAS), and provision of this version to focus groups. The eighth stage was performed by a monolingual group, appropriate to the reality of the deaf population and described in the article, for the first review of the focus group discussion. In the ninth step, a bilingual group performed the review, while the tenth stage was focused on syntactic and semantic analysis and the second back translation. The eleventh stage was focused on the re-evaluation of the back translation by the bilingual group, culminating in the twelfth stage, focused on the filming of the version to be made available in software. The final stage dealt with the software development of the LIBRAS version of the instrument, made available online.

Mixed translations

Jones et al.[15] based their translation on the model adapted from Brislin, developed for oral language using the derived etic paradigm, merging individualized translation processes with group translations. The first translation was performed by a deaf bilingual person in consultation with

two researchers, the items of this translation being analyzed by a group of bilingual deaf and hearing people. An interpreter with sign language as his first language, son of deaf parents, who had not had contact with the original instrument, performed the back translation. The researchers compared this version with the original instrument, noting the discrepancies. Two deaf adults and one interpreter conducted a group discussion, resulting in a second version of the instrument, which was back translated by an interpreter while the researcher took notes, and also forwarded to an independent copier for review and comment. A new revision of the translations and comments was carried out in a group, and a test was applied involving four deaf adults. This process culminated in the final version, filmed in a studio.

DISCUSSION

Methodological studies of translation, cross-cultural adaptation and validation are a great challenge. In proposing the use of an instrument for a particular population, before applying it, it needs to be adapted to the needs of the population and to the use in different cultural contexts.[16]

The process of conducting methodological studies of translation, cultural adaptation and validation implies careful management in all stages. The challenges and the first difficulties already appear during the selection of the subjects that should compose the research group. The deaf population is characterized as a minority and there are clear shortages of bilingual professionals and researchers in sign language. Aspects such as the survey of qualified professionals, care in recruiting a portion of this population for the application of the pilot tests, without prejudice or significant decrease of the sample for later validation, need to be constantly discussed and considered, as well as factors that directly impact the operational development of the research.

Three important operational issues are identified, in addition to cultural influences, which should receive special attention during methodological studies: language proficiency assessment, instrument translation and examiner bias. These aspects are fundamental to identify items of instruments difficult to translate into another language, items with a change of meaning or words, and different concepts among the selected languages.[17]

In the category Individualized Translation Processes, the positive characteristic of articles by Pardo-Guijarro et al.[7], Rogers et al.[8-10] and Levinger and Ronen,[11] is that, in their discussions, they work with several simultaneous translations, generating a single translation after a synthesis process. In the literature, it is argued that bilingual and bicultural researchers or participants, when varied, become key players in the translation process.[18] Research members with diverse characteristics in training and acting, such as researchers, lay consultants, professionals and volunteers, enrich the translation process by discussing regional variations of colloquial signs and terms.[15] Factors such as the age of the team of researchers and translators can still be considered, depending on the target population of the instrument.

The choice of the translation and back translation method can be closely related to reliable data and more appropriate clinical practice when appropriate instrument measures are sought. In this present review, in relation to the instruments and their thematic areas, questionnaires and tools related to quality of life and mental health were predominant.

Access and health services for the deaf population present significant challenges and barriers related to language skills and communication.[19] These limitations in communication, in addition to making effective care impossible, may generate negative health events, such as reduction of patient satisfaction, loss of confidentiality and autonomy.[20]

A study carried out in Australia found that deaf people experience great difficulties in accessing health data, limited oral language, and poor availability of sign language materials and information.[21] Of the 72 participants in this study, only nine reported having confidence in their skills in the country's oral language, which was English.

Among the deaf population, difficulties related to access to primary care are reported for those with mental illnesses, which can cause significant impacts in the quality of life, even in high-income countries or concerned with putting in practice accessible and adequate public policies.[22]

In the Group translations category, Samady et al.[12] and Øhre et al.[13] present another possibility of translation based on collective discussions. In the literature, however, there is criticism against this method, emphasizing that care is due in the use of methods in which translators work together, as they can share misunderstandings and compromise one another.[3]

In all articles, back translation was used by at least two people, or in groups of bilingual, mostly deaf people. In group or individualized, without back translation, the efficiency of the translation

of the instruments cannot be verified, which is an essential step. This process should aim to translate the version from the target language to the source language, aiming to detect discrepant items in both versions.[3]

On the category Translations with adjustments by monolingual and bilingual group, the literature[14] shows that back translation combined with bilingual and monolingual tests would be the most complete translation of instruments. This would permit detecting and correcting discrepancies between the source and target language versions, as well as applying tests to increase the clarity and appropriate use, based on the perception of bilingual and monolingual subjects in the target language. Nevertheless, this protocol is complex, involving many phases, and demands the commitment of time and resources. It is only possible if many bilingual subjects can be found.[3]

No deaf person is truly monolingual, as he transits in an environment where exposure to written language is unavoidable, being somewhat bilingual.[21] Therefore, bilingual translators or monolingual judges, native to the source language, may be difficult to locate, demanding adaptations.

In relation to the monolingual group, Chaveiro et al.[14] point out that, in some cases, finding people with no knowledge of the source language of the questionnaire becomes difficult. Nevertheless, the monolingual group can act by observing translation aspects that are not understandable and ambiguous linguistic structures according to the target language.

Most studies use translation with back translation, but there is variation in the number of translators who participated in each step. Rarely do these studies provide information on how this selection, qualification or training occurred.

In the Mixed Translations category, the authors point out that translation methods vary in terms of process and result, and that strategies are based on the researcher's expectations, seeking linguistic or conceptual equivalence. The process of sign language translation, however, adds levels of complexity to the administration modality, ranging written to sign language. In order to ensure coherence, challenges are related to time, technology and the people involved.[15]

Failure to adapt the instrument to the language of a particular culture withdraws the access to information from the participant, requiring third parties for mediation. This process can increase the risk of bias in environments that are not sensitive to diversity, with the potential to increase the risk of distortions in the research.[2] Using a third party to mediate this process requires control of complex ethical variables though, such as confidentiality, which can compromise the veracity of the answers and withdraw the subjects' autonomy in important aspects of their lives.

In the article by Jones et al.,[15] in the first phase, the translator could consult the researchers in case of doubt. The qualifications of the translator and his approximation to the culture and use of the language are important to maintain the meaning of the terms of the instruments. Some studies point out that bilingual consultants who have contact with the target population may be more feasible due to the contact with the local dialect when compared to professional translators. The solution to these challenges, according to the article in the Mixed Translations category, would then be to select a combination of translators.

Around the world, deaf communities are well known for preferring visual materials as well as sign language guidelines, because of the cognitive aspects and visual thinking strategies this population favors.[23] In Levinger and Ronen's article,[11] it is argued that the way the instruments, guidelines and materials are presented is crucial, because it is not known to what extent deaf people understand the questionnaires or written interviews, and this format may not be adequate for this population, affecting the results. In this review, it was verified that all articles opted to make a final version available online in videos, and still others through a specific software in the sign language.

Five different sign languages were found in the results. Sign languages have specific grammar, with structures such as the use of space and facial expressions. The identity of the deaf is linked to shared experiences and the sense of belonging to a community of signs. This identity has variations, but culture and sign language are elements that build and ground the deaf community.[24]

All countries have minority groups whose health needs are little studied and explored.[25] Encouraging research focused on these populations offers innumerable benefits to public entities and managers, helping to develop programs that have a positive impact on public health. Specifically with the deaf population, sign language research can reduce biases in responses, pointing out priority data and essential information for future interventions.

Considering the reflections and the discussions about the importance of choosing a model that guarantees the quality and validation of the

translation during the development of this type of study, some authors highlight factors that may influence the choice of the method, such as: study objectives, availability of translators, judges and bilingual subjects, budget and time.[3] When verifying that there is still no consensus, after the contents raised and discussed according to the literature, for those instruments and research groups that do not have a mandatory protocol for the country or from some specific organization, the authors of this review propose a method with translation phases, as displayed in table 3.

Table 3 – Recommendations and phases of translation method into sign language proposed by the authors. Uberaba, MG, Brazil, 2016

Proposed evidence-based method for translation into sign language*	
Phases and description	**Recommendations**
Phase 1: translation from original language into sign language	Individualized translations, registered on video, with bilingual and bicultural participants linked to deaf community, with heterogeneous profiles in aspects such as age, socioeconomic level and education, who can be interpreters, deaf people and health professional. Following the evidences surveyed in this review, three to five translations are suggested
Phase 2: synthesis of translations in single version, called version two (V2)	Analysis and synthesis of translations to elaborate V2. This version should be developed by research group involving bilingual and bicultural people, such as interpreters, members of the deaf community and professionals
Phase 3: back translation through translation from sign language (V2) into language of original instrument	Translation from sign language to language of original instrument, aiming to guarantee that the instrument is the same in both languages. Based on the discussions of this review, at least two bilingual and bicultural translators are recommended, being one deaf person and one interpreter, who had no contact with the original instrument
Phase 4: review by experts and creation of pre-final version (Vpf) on video	A group of judges consisting of expert researchers and translators/interpreters needs to analyze the translations and back translations, if possible in partnership with the author of the original instrument, and develop the cross-cultural adaptation of the instrument. This should culminate in the creation of the Vpf on video
Phase 5: pilot of instrument and creation of final version (FV)	Application of the instrument (Vpf) with pilot-test to guarantee acceptable internal consistency with indication of good reliability for further validation of the instrument in sign language

*All phases need to be registered in video/recording.

As a limitation of this review, it is emphasized that non-standardized research instruments, instruments from other areas of knowledge or that used only simple translations were not included. Despite this limitation, the review has brought to light a scenario that has not yet been explored, with recommendations that may enhance the chances of success in methodological studies involving the sign language user population.

CONCLUSION

This integrative review evidenced the non-standardization of methods for the translation of instruments into sign language. In the studies, the participation of bilingual and bicultural individuals prevailed. Some steps were fundamental to maintain the credibility of the methodological studies focused on the deaf population. In view of the evidence, the

authors proposed a five-stage method of sign language translation: individualized translation with three to five people linked to the deaf community with heterogeneous profiles (age, socioeconomic level and education); synthesis of translations; back translation with at least one interpreter and one deaf person; analysis and adjustments by expert judges; and pilot test application and creation of filmed final version. These steps may help to reduce the chance of bias and enhance the applicability of the results of transcultural translations and adaptations in sign language.

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